

Methods for estimating HIV incidence

Expanded list of references

References

1. UNAIDS Reference Group. Improved methods and assumptions for estimation of the HIV/AIDS epidemic and its impact: Recommendations of the UNAIDS Reference Group on Estimates, Modelling and Projections. *AIDS* 2002;16(9):W1-14.
2. Ghys PD, Brown T, Grassly NC, Garnett G, Stanecki KA, Stover J, et al. The UNAIDS Estimation and Projection Package: a software package to estimate and project national HIV epidemics. *Sex Transm Infect* 2004;80(suppl_1):i5-9.
3. Brown T, Salomon JA, Alkema L, Raftery AE, Gouws E. Progress and challenges in modelling country-level HIV/AIDS epidemics: the UNAIDS Estimation and Projection Package 2007. *Sex Transm Infect* 2008;84 Suppl 1:i5-i10.
4. Stover J. Projecting the demographic consequences of adult HIV prevalence trends: the Spectrum Projection Package. *Sex Transm Infect* 2004;80(suppl_1):i14-18.
5. Stover J, Johnson P, Zaba B, Zwahlen M, Dabis F, Ekpini RE. The Spectrum projection package: improvements in estimating mortality, ART needs, PMTCT impact and uncertainty bounds. *Sex Transm Infect* 2008;84 Suppl 1:i24-i30.
6. Hallett T, Zaba B, Todd J, Lopman B, et al. Estimating Incidence from Prevalence in Generalised HIV Epidemics: Methods and Validation. *PLoS Med* 2008;5(4):e80.
7. Pisani E, Garnett GP, Brown T, Stover J, Grassly NC, Hankins C, et al. Back to basics in HIV prevention: focus on exposure. *British Medical Journal* 2003;326:1384-1387.
8. Gouws E, White PJ, Stover J, Brown T. Short term estimates of adult HIV incidence by mode of transmission: Kenya and Thailand as examples. *Sex Transm Infect* 2006;82 Suppl 3:iii51-55.
9. Brown T, Peerapatnapokin W. The Asian Epidemic Model: a process model for exploring HIV policy and programme alternatives in Asia. *Sex Transm Infect* 2004;80(suppl_1):i19-24.
10. A2 Analysis and Advocacy. Combining Epidemiology and Economic Analysis to inform the response to the HIV epidemic in Ho Chi Minh City. . Ho Chi Minh City, Vietnam: Analysis and Advocacy Project, Ho Chi Minh City Provincial AIDS Committee, National Institute of Hygiene and Epidemiology, Family Health International, East-West Centre, USAID, 2006.
11. Gregson S, Donnelly CA, Parker CG, Anderson RM. Demographic approaches to the estimation of incidence of HIV-1 infection among adults from age-specific prevalence data in stable endemic conditions. *AIDS* 1996;10:1689-1697.
12. Williams B, Gouws E, Wilkinson D, Karim SA. Estimating HIV incidence rates from age prevalence data in epidemic situations. *Stat Med* 2001;20(13):2003-16.

13. Actuarial Society of South Africa AIDS sub-committee. ASSA2002 AIDS and demographic model (online). Available: <http://www.assa.org.za/information/AIDS/AIDSmodel>, 2004.
14. Dorrington RE, Bradshaw D, Budlender D. AIDS Profile in the Provinces of South Africa: Indicators for 2002. Cape Town: University of Cape Town, Medical Research Council, Actuarial Society of South Africa, 2002:35.
15. Groenewald P, Nannan N, Bourne D, Laubscher R, Bradshaw D. Identifying deaths from AIDS in South Africa. *Aids* 2005;19(2):193-201.
16. Brookmeyer R, Gail MH. *AIDS epidemiology: A quantitative approach*. New York: Oxford University Press, 1992.
17. Heyward WL, Osmanov S, Saba J, Esparza J, Belsey E, Stoneburner R, et al. Preparation for Phase III vaccine efficacy trials: methods for the determination of HIV incidence. *AIDS* 1994;8:1285-1291.
18. Brundage JF, Burke DS, Gardner LI, McNeil JG, Goldenbaum M, Visintine R, et al. Tracking the spread of the HIV infection epidemic among young adults in the United States: Results of the first four years of screening among civilian applicants for U.S. military service. *Journal of Acquired Immune Deficiency Syndromes* 1990;3:1168-1180.
19. Bucyendore A, Van de Perre P, Karita E, Nziyumvira A, Sow I, Fox E. Estimating the seroincidence of HIV-1 in the general adult population in Kigali, Rwanda. *AIDS* 1993;7:275-277.
20. Ghys PD, Kufa E, George MV. Measuring trends in prevalence and incidence of HIV infection in countries with generalised epidemics. *Sex Transm Infect* 2006;82 Suppl 1:i52-6.
21. Zaba B, Boerma T, White R. Monitoring the AIDS epidemic using HIV prevalence data among young women attending antenatal clinics: prospects and problems. *AIDS* 2000;14(11):1633-45.
22. Stuart J. Under-reporting of AIDS. *South African Medical Journal* 1993;83:689.
23. Brookmeyer R, Quinn TC. Estimation of current human immunodeficiency virus incidence rates from a cross-sectional survey using early diagnostic tests. *Am. J. Epidemiol* 1995;141:166 - 172.
24. Courouce AM. Sensitivity of screening kits for anti-HIV antibodies. Retrovirus Working Group of the French Society for Blood Transfusion. *Transfus. Clin. Biol* 1999;6:381-394.
25. Quinn TC, Brookmeyer R, Kline R, Shepherd M, Paranjape R, Mehendale S, et al. Feasibility of pooling sera for HIV-1 viral RNA to diagnose acute primary HIV infection and estimate HIV incidence. *AIDS* 2000;14:2751-2757.
26. Pilcher CD, McPherson JT, Leone PA, Smurzynski M, Owen-O'Dowd J, Peace-Brewer AL, et al. Real-time, universal screening for acute HIV infection in a routine HIV counselling and testing population. *Journal of the American Medical Association* 2002;288(2):216-221.
27. Janssens RS, Satten GA, Stramer SL, et al. New testing strategy to detect early HIV-1 infection for use in incidence estimates and for clinical and prevention purposes. *JAMA* 1998;280:42-48.
28. Parekh BS, McDougal JS. Application of laboratory methods for estimation of HIV-1 incidence. *Indian Journal for Medical Research* 2005;121:510-518.

29. Suligoi B, Galli C, Massi M, Di Sora F, Sciandra M, Pezzotti P, et al. Precision and accuracy of a procedure for detecting recent human immunodeficiency virus infections by calculating the antibody avidity index by an automated immunoassay-based method. *J Clin Microbiol* 2002;40(11):4015-20.
30. Barin F, Nardone A. Monitoring HIV epidemiology using assays for recent infection: where are we? *Eurosurveillance* 2008;13(36):pii=18967 (Available online: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=18967>).
31. Busch MP, Satten GA. Time course of viremia and antibody seroconversion following human immunodeficiency virus exposure. *Am J Med* 1997;102(5B):117-24; discussion 125-6.
32. Murphy G, Parry JV. Assays for the detection of recent infections with human immunodeficiency virus type 1. *Eurosurveillance* 2008;13(36):pii=18966 (Available online: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=18966>).
33. Brookmeyer R, Quinn T, Shepherd M, Mehendale S, Rodrigue J, Bollinger R. The AIDS epidemic in India: a new method for estimating current human immunodeficiency virus (HIV) incidence rates. *Am J Epidemiol* 1995;142(7):709-13.
34. McDougal JS, Pilcher CD, Parekh BS, Gershy-Damet G, Branson BM, Marsh K, et al. Surveillance for HIV-1 incidence using tests for recent infection in resource-constrained countries. *Aids* 2005;19 Suppl 2:S25-30.
35. Le Vu S, Pillonel J, Semaille C, Bernillon P, Le Strat Y, Meyer L, et al. Principles and HIV incidence estimation from recent infection testing - a review. *Euro Surveillance* 2008;13(36):pii=18969 (Available online: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=18969>).
36. McFarland W, Busch MP, Kellogg TA, Rawal BD, Satten GA, Katz MH, et al. Detection of early HIV infection and estimation of incidence using a sensitive/less-sensitive Enzyme Immunoassay testing strategy at anonymous counselling and testing sites in San Francisco. *Journal Acquired Immune Deficiency Syndrome* 1999;22:484-489.
37. Dobbs T, Kennedy S, Pau CP, McDougal JS, Parekh BS. Performance characteristics of the Immunoglobulin G-capture BED-enzyme immunoassay, an assay to detect recent Human Immunodeficiency Virus type I seroconversion. *Journal of Clinical Microbiology* 2004;42:2623-2628.
38. Parekh BS, McDougal JS. New approaches for detecting recent HIV-1 infection. *AIDS Review* 2001;3:183-193.
39. UNAIDS. UNAIDS Reference Group on Estimates, Modelling and Projections statement on the use of the BED-assay for the estimates of HIV-1 incidence for surveillance or epidemic monitoring (available at http://data.unaids.org/pub/EPISlides/2006/Statement_BED_Policy_13Dec05_en.pdf), 2005.
40. Barin F, Meyer L, Lancar R, Deveau C, Gharib M, Laporte A, et al. Development and validation of an immunoassay for identification of recent human immunodeficiency virus type 1 infections and its use on dried serum spots. *J Clin Microbiol* 2005;43(9):4441-7.

41. Wilson KM, Johnson EI, Croom HA, Richards KM, Doughty L, Cunningham PH, et al. Incidence immunoassay for distinguishing recent from established HIV-1 infection in therapy-naïve populations. *Aids* 2004;18(17):2253-9.
42. Schupbach J, Gebhardt MD, Tomasik Z, Niederhauser C, Yerly S, Burgisser P, et al. Assessment of recent HIV-1 infection by a line immunoassay for HIV-1/2 confirmation. *PLoS Med* 2007;4(12):e343.
43. McDougal JS, Parekh BS, Peterson ML, Branson BM, Dobbs T, Ackers M, et al. Comparison of HIV type 1 incidence observed during longitudinal follow-up with incidence estimated by cross-sectional analysis using the BED capture enzyme immunoassay. *AIDS Res Hum Retroviruses* 2006;22(10):945-52.
44. Hall HI, Song R, Rhodes P, Prejean J, An Q, Lee LM, et al. Estimation of HIV incidence in the United States. *Jama* 2008;300(5):520-9.
45. Hargrove JW, Humphrey JH, Mutasa K, Parekh BS, McDougal JS, Ntozini R, et al. Improved HIV-1 incidence estimates using the BED capture enzyme immunoassay. *Aids* 2008;22(4):511-8.
46. Mermin J, Musinguzi J, Opio A, Kirungi W, Ekwaru JP, Hladik W, et al. Risk factors for recent HIV infection in Uganda. *Jama* 2008;300(5):540-9.
47. Barnighausen T, Wallrauch C, Welte A, McWalter TA, Mbizana N, Viljoen J, et al. HIV incidence in rural South Africa: comparison of estimates from longitudinal surveillance and cross-sectional cBED assay testing. *PLoS ONE* 2008;3(11):e3640.
48. Sakarovich C, Rouet F, Murphy G, Minga AK, Alioum A, Dabis F, et al. Do tests devised to detect recent HIV-1 infection provide reliable estimates of incidence in Africa? *J Acquir Immune Defic Syndr* 2007;45(1):115-22.
49. Rehle T, Shisana O, Pillay V, Zuma K, Puren A, Parker W. National HIV incidence measures--new insights into the South African epidemic. *S Afr Med J* 2007;97(3):194-9.
50. Karita E, Price M, Hunter E, Chomba E, Allen S, Fei L, et al. Investigating the utility of the HIV-1 BED capture enzyme immunoassay using cross-sectional and longitudinal seroconverter specimens from Africa. *Aids* 2007;21(4):403-8.
51. Wolday D, Meles H, Hailu E, Messele T, Mengistu Y, Fekadu M, et al. Temporal trends in the incidence of HIV infection in antenatal clinic attendees in Addis Ababa, Ethiopia, 1995-2003. *J Intern Med* 2007;261(2):132-7.
52. Welte A, McWalter TA, Barnighausen T. A Simplified Formula for Inferring HIV Incidence from Cross-Sectional Surveys Using a Test for Recent Infection. *AIDS Res Hum Retroviruses* 2009;25(1):125-6.
53. McWalter T, Welte A. Relating recent infection prevalence to incidence with a sub-population of non-progressors. *Submitted for publication* 2009.
54. Laeyendecker O, Rothman RE, Henson C, Horne BJ, Ketlogetswe KS, Kraus CK, et al. The effect of viral suppression on cross-sectional incidence testing in the Johns Hopkins hospital emergency department. *J Acquir Immune Defic Syndr* 2008;48(2):211-5.
55. Editorial team. Workshop on the Serological Testing Algorithm for Recent HIV Seroconversion (STARHS) and HIV Incidence Estimates, Stockholm, 11-12 March 2008. *Eurosurveillance* 2008;13(36):pii=18972 (Available online: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=18972>).

